**Nimisia deusta**, the correct name for *N. fuegiae*, with additional notes on morphology, chemical composition, and distribution

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**Abstract:** *Nimisia deusta*, based on *Parmelia enteromorpha* var. *deusta*, is shown to be the correct name for the species currently known as *N. fuegiae*. Original material collected by J. D. Hooker in 1842, and collections made by Henry Imshaug between 1968 and 1971, have shown that the species is more widely distributed than previously reported, being known throughout the southern tip of South America (Argentina: Isla Grande de Tierra del Fuego, Isla de los Estados; Chile: Cape Horn Islands; Falkland Islands), that it has a uniform secondary metabolite chemistry of fumarprotocetraric acid in the upper medulla (not lacking lichen substances as previously reported), and that it is not uniformly black but has a partly pale brown upper cortex.

**Key words:** Argentina, *Cetraria*, Chile, Falkland Islands, *Himantormia*, *Parmeliaceae*

**Introduction**

The genus *Nimisia* was erected by Kärnefelt & Thell (1993) for an enigmatic, cetrarioid species in the *Parmeliaceae*. This species was known from a single collection made by Professors Pier Luigi Nimis & Josef Poelt from Tierra del Fuego and, because they could find no previously published name for it, they described it as a new species, *N. fuegiae* Kärnefelt & A. Thell (*op. cit.*).

However, during a US National Science Foundation funded project to computerize the label data of the entire lichen collection at the herbarium of Michigan State University (MSC), the author discovered several collections from southern South America that were referable to this species. These collections had been made between 1968 and 1971 by Dr Henry Imshaug, who was curator of the cryptogamic herbarium from 1958–1990 (Fryday & Prather 2001) and his then graduate students Richard Harris and Karl Ohlsson. These specimens were first suggested to represent a new species in the monotypic genus *Himantormia* I. M. Lamb (Imshaug 1969); a determination provisionally supported by Lamb in an undated note attached to one of the specimens. The specimens do resemble *Himantormia lugubris* (Hue) I. M. Lamb, but differ in anatomical structure, especially in having much larger (to 20 μm) cortical cells than *Himantormia* (Lamb 1964), and chemistry; *H. lugubris* containing barbatic and alectorialic acids, resulting in the lower thallus reacting Pd+ yellow, whereas *Nimisia* is reported to lack secondary metabolites (but see below). Imshaug later annotated the collections as *Cetraria deusta* (Hook. f. & Taylor) Imshaug and accessioned them into the herbarium, although he never published this new combination, in part because he knew they did not belong in *Cetraria* s. str. (R. S. Common pers. comm.).

The basionym of *Cetraria deusta* is *Parmelia enteromorpha* var. *deusta* Hook. f. & Taylor, which was later raised to species rank by Dodge (1965) as *Hypogymnia deusta* (Hook. f. & Taylor) C. W. Dodge. As this name has precedence at the species rank because of Dodge’s combination, the necessary new combination is made below. Notes are also provided on the morphological and
chemical variation evident in the additional material of this species now available for study.

Materials and Methods

Morphological observations are based on material held in MSC, the original Hooker collections of Parmelia enteromorpha var. deusta from E, and isotypes of N. fuegiae from DUKE and TSB. The thallus medulla was tested with para-phenylenediamine (Pd) by placing a fresh crystal on the tip of a one-sided razor blade, adding a small drop of 100% methyl alcohol, then touching the tip of the razor blade to the area being tested so that the solution was taken up by the thallus. All specimens cited are held in MSC unless otherwise noted.

Selected additional comparative material examined.


Nomenclature

No original material of Parmelia enteromorpha var. deusta could be found in BM or K (where Hooker's collections are housed) or in FH (which houses Taylor's herbarium). The only original material found was located in E, where there are four packets with completely handwritten labels. The original labels of (1) and (2) below are clearly in Hooker's hand, whereas those of (3) & (4) have the original “Ant. Exp.” blue labels. Additional information has been added by W. Young, the curator of E in the 1920s. Young's annotations are here placed within square brackets, and the identity of the material as determined by Dr Coppins (E) and confirmed by the author, on a separate line.

1 Parm[elia] enteromorpha var [deusta], Kater's Peak, [Ant. Exp. 1839–43 Dr. Hooker].
   Unmounted material; all Hypogymnia lugubris.

2 Parm enteromorpha [var. deusta], Mt Foster, [Antarctic].
   Unmounted material; all Nimisia.

3 Parmelia enteromorpha Ach. var. [deusta Hk. & Tayl.], Hermite Island, Cape Horn, Antarct. Exp. 1839–1843, J.D.H.
   Mounted on paper; a mixture of Hypogymnia lugubris and Nimisia.

4 Parmelia enteromorpha Ach. [deusta Hk. & Tayl.], Hermite Island, Cape Horn, Antarct. Exp. 1839–1843, J.D.H.
   Unmounted material; mostly Hypogymnia lugubris, but one piece of Nimisia found.

Kater's Peak and Mt Foster are close together near the east coast of Isla Hermite, so all these collections are from Isla Hermite, and almost certainly from the same area of the island.

In the protologue, Hooker (1847) describes Parmelia enteromorpha var. deusta as “parvula, rigida, thallo suberecto, brevi subflabellutim diverso, lobis atris patulis angustis canaliculatis utrinque concloribus. Barren rocks near the top of Kater's peak”.

Hypogymnia lugubris is easily separated from Nimisia by its inflated rounded lobes, lighter colour, and different chemistry. Hooker's description, especially “lobis atris patulis angustis canaliculatis utrinque concoloribus” (lobes black on both sides, spreading, narrow, grooved), clearly refers to Nimisia rather than H. lugubris, and so the Kater's Peak collection (1 above) that contains only H. lugubris cannot be considered as the 'holotype' because it does not agree with the protologue, and a lectotype must be chosen instead. This must be made from the original material (which includes both unpublished and published specimens—ICBN 9.2 n2) and should be the specimen that most
closely resembles the original description (ICBN 9.12), i.e. one of the *Nimisia* specimens in E. As the collection from Mt. Foster (2 above), is the only non-mixed collection, it is here designated as the lectotype of *Parmelia enteromorpha* var. *deusta* and the necessary new combination is made below.

One further nomenclatural problem remains to be discussed. Although Taylor was the second author of *Lichenes Antarctici* (Hooker & Taylor 1844), where the majority of the new species collected by Hooker are described, Hooker is the sole author of *Flora Antartica* (Hooker 1847). The “Lichenes” section of Pt I of *Flora Antartica* is attributed to “Dr Thomas Taylor and J. D. Hooker”, but no authors are credited with writing the “Lichenes” section of Pt II (pg. 519) where *Parmelia enteromorpha* var. *deusta* is described. Although Hooker refers to “we” several times in the “Lichenes” section (e.g. in the discussion of the distribution of *Parmelia enteromorpha*, but not var. *deusta*), and acknowledges the assistance of the Rev. Churchill Babington in a footnote to the “Lichenes” section of Pt II, at the end of the section on *Stereocaulon* (p. 528) he says “we are indebted to the Rev. Churchill Babington . . .” so clearly “we” is not Hooker and Babington. It is probable that “we” is Hooker & Taylor, although elsewhere in *Flora Antartica* Pt II Taylor is acknowledged when he is the second author (e.g. *Lecanora babingtonii* Hook. fil. et Tayl.”, p. 535), but because Taylor is not explicitly acknowledged in the description of *Parmelia enteromorpha* var. *deusta*, we must assume that Hooker alone is the author of the name and the author citation emended to ‘Hook. f.’

*Nimisia deusta* (Hook. f.) Fryday, comb. nov.


(Figs 1 & 2)

With a few exceptions, which are discussed in detail below, the descriptions of *Nimisia* and *N. fuegiae* provided by Kärnefelt & Thell (1993) are excellent and so a full description is not provided here.

*Morphological variation.* Both Hooker (1847) and Kärnefelt & Thell (1993) reported the thallus of *Nimisia* as being
uniformly black on both surfaces. However, although this often appears to be the case, the upper surface of most specimens have a pale brown colouration (Fig. 1A), especially near the base, that is interrupted by numerous raised black ridges and spots. On closer inspection, this pale brown colouration can often be observed in those specimens that initially appear to be uniformly dark. However, the lower surface is uniformly black (Fig. 1B). The distinctive character of *Nimisia* is its unique cortical structure, so the fact that Kärnefelt & Thell (1993) described the thallus as black (*lobis nigris*) in their diagnosis is of little consequence.

The collections from the Falkland Islands (Islas Malvinas) differ from those from Fuegia in having a much more robust thallus with convex lobes (Fig. 2). However, these are intermixed with typical forms, and because all have the same characteristic cortex composed of large (to 20 μm) cells, as well as a uniform chemistry and identical apothecial anatomy, I have no hesitation in including them in *N. deusta*.

**Secondary metabolite chemistry.** Kärnefelt & Thell (1993) reported that the thallus of *Nimisia* lacked any secondary compounds; all spot tests being negative and no substances being detected by TLC. However, several of the collections in MSC had been subjected to TLC and all except one (*Imshaug 51763*) were found to contain fumarprotocetraric acid. A further collection (*Imshaug 40088*) had conflicting TLC results; one fragment containing fumarprotocetraric acid, another no substances. The medulla of the specimens that had not been subjected to TLC were tested with Pd and all produced the orange-red reaction typical of fumarprotocetraric acid. The medulla of the collection with a negative TLC result was also tested with Pd and this too was found to contain fumarprotocetraric acid. Similarly, all of Hooker's original collections and two isotypes of *N. fuegiae* (DUKE, TSB) also reacted Pd+ orange-red, indicating the presence of fumarprotocetraric acid. However, a negative reaction with Pd was obtained with the TSB isotype when the tip of a fertile lobe was tested, but the tips of fertile lobes in other collections reacted Pd+ orange-red. It appears that the Pd+ orange-red reaction is confined to the upper medulla, and that the species is chemically uniform in containing fumarprotocetraric acid, but that this is irregularly produced and a false negative reaction is sometimes recorded. Kärnefelt & Thell (1993) make no mention of secondary metabolite chemistry in the diagnosis of the genus, but in the diagnosis *N. fuegiae* they state "*Metaboliti secundarii non indicati*", which is incorrect and so the diagnosis of the species should be emended accordingly.

**Distribution.** Kärnefelt & Thell (1993) reported *Nimisia* from a single locality in Argentinean Tierra del Fuego. With the addition of Hooker's collections and those made by Imshaug in MSC, it can be seen

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Fig. 2. *Nimisia deusta* (Imshaug 40134) & Harris from the Falkland Islands. Scale=5 mm.
that the species is fairly widespread over the southern extremity of South America (Fig. 3). Adler & Calvelo (2002) discussed the distribution patterns shown by species of the Parmeliaceae that occurred in Tierra del Fuego, showing that Nimisia ‘fuegiae’ was the only species of the family that was endemic to the area. However, they concluded that Nimisia was unlikely to be a Tierra del Fuego endemic and probably had a Patagonian-Andean distribution, extending further north along the Cordillera de los Andes. The additional records of Nimisia reported here support this conclusion. The habitat data of the collections indicates that it is a species of summits and hill tops suggesting that it probably does occur further north. It is also possible that Nimisia occurs further south on, for example, the South Shetland Islands or the Antarctic peninsula. Because of its superficial resemblance to Himantormia lugubris a representative selection of twelve collections of this species was obtained on loan from AAS, but no Nimisia was found among them.
Systematic position. Kärnefelt & Thell (1993) tentatively suggested that Nimisia was most closely related to Cornicularia (Schreb.) Hoffm., although they acknowledged that the two genera occupied completely different biogeographical regions; Cornicularia occurs exclusively in oceanic areas of the northern hemisphere. Unfortunately, it was not possible to include Nimisia in the comprehensive systematic analyses of the cetrarioid lichens (Thell et al. 2002) or the Parmeliaceae (Thell et al. 2004), because of the absence of recently collected material. However, these authors again suggested that the genus, along with Himantormia, may be related to Cornicularia; a genus which belonged in the same clade as Nodobryoria abbreviata (Müll. Arg.) Common & Brodo, Pseudephebe pubescens (L.) M. Choisy, and two foliose species, Asahinea chrysantha (Tuck.) W. L. Cubb. & C. F. Cubb. and Hypotrachyna revoluta (Flörke) Hale in their previous analyses (Thell et al. 2002); although there was no bootstrap support for this clade. Further evidence for the systematic position of Nimisia comes from cell wall polysaccharide composition, a character that has been shown to be significant at the genus level elsewhere in the Parmeliaceae (e.g. Common & Brodo 1995; Blanco et al. 2004). Cornicularia and Pseudephebe contain Cetraria-type lichenan, whereas Nimisia, Nodobryoria and Himantormia are lichenan negative (Common 1991 & pers. comm.). As the Antarctic endemic monotypic genus Himantormia resembles Nimisia in many respects (Kärnefelt & Thell 1993; Table 1), differing primarily in the structure of the thalline cortex, and the two genera also occur in adjacent biogeographical regions and have cell walls lacking lichenan, it appears probable that these two genera are most closely related, but their position within the Parmeliaceae remains to be investigated.

Additional specimens examined. Nimisia deusta: Argentina: Isla de los Estados: Puerto San Juan: subalpine to alpine summit of mountain at the SE corner of bay, 54°46’S 63°53’W, 450 m, 1971, Imshaug (51763) & Ohlsson; Puerto Parry, subalpine summit of Monte Fitzton on W side of entrance to inner bay, 54°47’S 64°23’W, 456 m, 1971, Imshaug (53686) & Ohlsson. Tierra del Fuego: Isla Grande, Sierra Alvear, krummholz region on W side of Paso Garibaldi, 54°42’S 67°47’W, 460 m, 1971, Imshaug (54810) & Ohlsson; Sierra de Sorondo, alpine region on summit of mountain to the E of Monte Olivia, 54°43’S 68°07’W, 970 m, 1971, Imshaug (55578, 55611) & Ohlsson.—Falkland Islands [Islas Malvinas]: East Falklands [Isla Soledad]: Mt. Usborne, fieldmark outcrops on summit of Table Rock, UTM Grid 21F UC 7868, 1800 ft [549m], 1968, Imshaug (40088, 40128, 40134) & Harris. West Falklands [Isla Gran Malvina]: Mt. Adam, outcrops on summit of southernmost peak, UTM Grid 21F TC 8781, 2250 ft [686 m], 1968, Imshaug (41100) & Harris.—Chile: Cape Horn, Isla Hermite, Antarct. Exp. 1839–1843, [ix 1842], J. D. Hooker (E).

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References


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